CLAIMS

We claim:

1. A spatial sound conference system comprising:

a conference station comprising:

right and left spatially disposed microphones connected to a communication channel for receiving right and left audio signals, wherein the differences between the right and left audio signals represent a head-related transfer function; and

a remote station comprising:

right and left spatially disposed loudspeakers connected to the communication channel.

2. A spatial sound conference system according to claim 1, further comprising:

a compression unit connected to the right and left spatially disposed microphones for compressing the right and left audio signals; and

a decompression unit connected to the right and left spatially disposed loudspeakers for decompressing the compressed right and left audio signals.

3. A spatial sound conference system according to claim 1, further comprising:

a microphone positioned in the remote station and connected to the communication channel for receiving an audio signal; and

a loudspeaker positioned in the conference station and connected through the communication channel to the microphone.

4. A spatial sound conference system according to claim 3, further comprising:

a compression unit connected to the microphone positioned in the remote station for compressing the audio signal; and

a decompression unit connected to the loudspeaker positioned in the conference station for decompressing the compressed audio signal.

5. A spatial sound conference system according to claim 1, wherein the right and left spatially disposed microphones are positioned on a dummy head.

6. A spatial sound conference system according to claim 5, further comprising:

a microphone positioned in the remote station and connected to the communication channel for receiving an audio signal; and

a loudspeaker positioned proximal to the dummy head and connected through the communication channel to the microphone.

7. A spatial sound conference system according to claim 5, further comprising:

a microphone positioned in the remote station and connected to the communication channel for receiving an audio signal; and

right and left spatially disposed loudspeakers positioned in the conference station and connected through the communication channel to the microphone.

8. A spatial sound conference system according to claim 5, further comprising:

a head-tracking sensor in the remote station connected to the communications channel; and

a position simulator attached to the dummy head and connected through the communication channel to the sensor.

9. A spatial sound conference system according to claim 1, further comprising:

a video camera positioned in the conference station and connected to the communication channel for receiving a video image; and

a display positioned in the remote station and connected through the communication channel to the video camera.

10. A spatial sound conference system according to claim 9, wherein the video camera is positioned near the location of eyes on a dummy head.

11. A spatial sound conference system according to claim 9, wherein the display is a head-mounted display.

12. A spatial sound conference system according to claim 1, wherein the right and left spatially disposed loudspeakers are a headset.

13. A method for conducting a spatial sound conference comprising the steps of:

converting audio information into right and left audio signals at a conference station, wherein the conversion imparts a differential characteristic to the right and left audio signals, and the differential characteristic is represented by a head-related transfer function, and the right and left audio signals comprise spatialized audio;

transmitting audio information representative of said spatialized audio from the conference station across a communication channel to a remote station; and

playing the spatialized audio in the remote station.

14. A method for conducting a spatial sound conference according to claim 13, further comprising the steps of:

compressing the right and left audio signals after the step of converting; and

decompressing the compressed right and left audio signals after the step of transmitting.

15. A spatial sound conference system comprising:

a transmitting station comprising:

a microphone connected to a communications system for receiving an audio signal;

a head-related transfer function unit connected to the communications system for imparting a head-related transfer function to the audio signal to produce a spatialized audio signal; and

a receiving station comprising:

right and left spatially disposed loudspeakers connected to the communication system for receiving the spatialized audio signal.

16. A spatial sound conference system according to claim 15, further comprising:

a compression unit connected to the microphone for compressing the audio signal; and

a decompression unit connected to the head-related transfer function unit for decompressing the compressed audio signal.

17. A spatial sound conference system according to claim 15, further comprising:

a compression unit connected to the head-related transfer function unit for compressing the spatialized audio signal; and

a decompression unit connected to the right and left spatially disposed loudspeakers for decompressing the compressed spatialized audio signal.

18. A spatial sound conference system according to claim 15, wherein the head-related transfer function unit is contained in a spatial sound conference bridge.

19. A method for conducting a spatial sound conference comprising the steps of:

receiving an audio signal at a transmitting station;

transmitting the audio signal from the transmitting station to a spatial sound conference bridge;

imparting a head-related transfer function to the audio signal to create a spatialized audio signal;

sending the spatialized audio signal from the spatial sound conference bridge to a receiving station; and

playing the spatialized audio signal on spatially disposed loudspeakers at the receiving station.

20. A method for conducting a spatial sound conference according to claim 19, further comprising the steps of:

compressing the audio signal after the step of receiving; and

decompressing the compressed audio signal after the step of transmitting.

21. A method for conducting a spatial sound conference according to claim 19, further comprising the steps of:

compressing the spatialized audio signal after the step of imparting; and

decompressing the compressed spatialized audio signal after the step of sending.

22. A method for conducting a spatial sound conference comprising the steps of:

receiving an audio signal at a transmitting station;

transmitting the audio signal from the transmitting station to a receiving station;

imparting a head-related transfer function to the audio signal to create spatialized audio signal;

playing the spatialized audio signal on spatially disposed loudspeakers in the receiving station.

23. A method for conducting a spatial sound conference according to claim 22, further comprising the steps of:

compressing the audio signal after the step of receiving; and

decompressing the compressed audio signal after the step of transmitting.

24. A spatial sound conference bridge comprising:

at least two input ports for receiving at least two audio signals;

a head-related transfer function unit connected to the at least two input ports for imparting a head-related transfer function to at least one received audio signal to produce at least one spatialized audio signal; and

at least two output ports connected to the head-related transfer function unit for transmitting the spatialized audio signal.

25. A spatial sound conference bridge according to claim 24, further comprising:

a decompression unit connected to at least one input port for decompressing at least one audio signal.

26. A spatial sound conference bridge according to claim 24, further comprising:

a compression unit connected to at least one output port for compressing at least one spatialized audio signal.

27. A method for conducting a spatial sound conference comprising the steps of:

receiving at least two monaural audio signals;

generating at least two sets of spatialized audio signals from the at least two monaural audio signals using at least two head-related transfer functions;

compiling at least one composite signal from the at least two sets of spatialized audio signals;

transmitting at least one composite signal to a location; and

playing at least one composite signal at the location.